

JC665 U.S. PTO
10/30/00

PATENT
Attorney Docket Number: 08250.0045-02

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

ASSISTANT COMMISSIONER FOR PATENTS
Washington, D.C. 20231

Prior Application: Art Unit: 2771

Examiner: T. Haven

JC825 U.S. PTO
09/698077
10/30/00

SIR: This is a request for filing a

☒ Continuation ☐ Continuation-in-Part ☐ Divisional Application under 37 C.F.R. § 1.53(b)
of pending prior application Serial No. 09/226,196 filed January 7, 1999 of Kenneth WILLS for
INFORMATION SEARCH AND RETRIEVAL WITH GEOGRAPHIC COORDINATES.

1. ☒ Enclosed is a complete copy of the prior application including the oath or Declaration and drawings, if any, as originally filed. I hereby verify that the attached papers are a true copy of prior application Serial No. 09/226,196 as originally filed on January 7, 1999.
2. ☐ Enclosed is a substitute specification under 37 C.F.R. § 1.125.
3. ☐ Cancel Claims ____.
4. ☒ A Preliminary Amendment is enclosed.
5. ☒ The filing fee is calculated on the basis of the claims existing in the prior application as amended at 3 and 4 above.

Basic Application Filing Fee					\$710	\$ \$710.00
	Number of Claims		Basic	Extra Claims		
Total Claims	24	-	20	4	x \$18	72.00
Independent Claims	6	-	3	3	x \$80	240.00
<input type="checkbox"/> Presentation of Multiple Dep. Claim(s)					+\$270	0.00
Subtotal						\$ 312.00
Reduction by 1/2 if small entity						- 0.00
TOTAL APPLICATION FILING FEE						\$ 1022.00

6. ☒ A check in the amount of \$1022.00 to cover the filing fee is enclosed.

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14. ☐ The power appears in the original declaration of the prior application.
15. ☐ Since the power does not appear in the original declaration, a copy of the power in the prior application is enclosed.
16. ☒ Please address all correspondence to FINNEGAN, HENDERSON, FARABOW, GARRETT and DUNNER, L.L.P., 1300 I Street, N.W., Washington, D.C. 20005-3315.
17. ☐ Recognize as associate attorney _____
18. ☒ Also enclosed are copies of revocation of Power of Attorney and grant of new Power of Attorney

PETITION FOR EXTENSION. If any extension of time is necessary for the filing of this application, including any extension in the parent application, serial no. 09/226,196, filed January 7, 1999, for the purpose of maintaining copendency between the parent application and this application, and such extension has not otherwise been requested, such an extension is hereby requested, and the Commissioner is authorized to charge necessary fees for such an extension to our Deposit Account No. 06-0916. A duplicate copy of this paper is enclosed for use in charging the deposit account.

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By: _____

Joseph E. Palys
Reg. No. 46,508

Cognitive Function		Mood		Quality of Life		Social Function		Health Status	
Measure	Score	Measure	Score	Measure	Score	Measure	Score	Measure	Score
MMSE	24.0	Depression	10.0	QoL	70.0	Social Support	50.0	Health Status	80.0
MoCA	22.0	Anxiety	12.0	QoL	65.0	Social Support	45.0	Health Status	75.0
Trail Making Test	15.0	Stress	15.0	QoL	60.0	Social Support	40.0	Health Status	70.0
Digit Span	10.0	Life Satisfaction	18.0	QoL	55.0	Social Support	35.0	Health Status	65.0
Block Design	12.0	Life Satisfaction	15.0	QoL	50.0	Social Support	30.0	Health Status	60.0
Verbal Fluency	18.0	Life Satisfaction	12.0	QoL	45.0	Social Support	25.0	Health Status	55.0
Stroop Test	14.0	Life Satisfaction	10.0	QoL	40.0	Social Support	20.0	Health Status	50.0
Digit Symbol	11.0	Life Satisfaction	8.0	QoL	35.0	Social Support	15.0	Health Status	45.0
Trail Making Test B	16.0	Life Satisfaction	7.0	QoL	30.0	Social Support	10.0	Health Status	40.0
Block Design	13.0	Life Satisfaction	6.0	QoL	25.0	Social Support	5.0	Health Status	35.0
Verbal Fluency	17.0	Life Satisfaction	5.0	QoL	20.0	Social Support	0.0	Health Status	30.0
Stroop Test	15.0	Life Satisfaction	4.0	QoL	15.0	Social Support	-5.0	Health Status	25.0
Digit Symbol	12.0	Life Satisfaction	3.0	QoL	10.0	Social Support	-10.0	Health Status	20.0
Trail Making Test B	17.0	Life Satisfaction	2.0	QoL	5.0	Social Support	-15.0	Health Status	15.0
Block Design	14.0	Life Satisfaction	1.0	QoL	0.0	Social Support	-20.0	Health Status	10.0
Verbal Fluency	19.0	Life Satisfaction	0.0	QoL	-5.0	Social Support	-25.0	Health Status	5.0
Stroop Test	16.0	Life Satisfaction	-1.0	QoL	-10.0	Social Support	-30.0	Health Status	0.0
Digit Symbol	13.0	Life Satisfaction	-2.0	QoL	-15.0	Social Support	-35.0	Health Status	-5.0
Trail Making Test B	18.0	Life Satisfaction	-3.0	QoL	-20.0	Social Support	-40.0	Health Status	-10.0
Block Design	15.0	Life Satisfaction	-4.0	QoL	-25.0	Social Support	-45.0	Health Status	-15.0
Verbal Fluency	20.0	Life Satisfaction	-5.0	QoL	-30.0	Social Support	-50.0	Health Status	-20.0
Stroop Test	17.0	Life Satisfaction	-6.0	QoL	-35.0	Social Support	-55.0	Health Status	-25.0
Digit Symbol	14.0	Life Satisfaction	-7.0	QoL	-40.0	Social Support	-60.0	Health Status	-30.0
Trail Making Test B	19.0	Life Satisfaction	-8.0	QoL	-45.0	Social Support	-65.0	Health Status	-35.0
Block Design	16.0	Life Satisfaction	-9.0	QoL	-50.0	Social Support	-70.0	Health Status	-40.0
Verbal Fluency	21.0	Life Satisfaction	-10.0	QoL	-55.0	Social Support	-75.0	Health Status	-45.0
Stroop Test	18.0	Life Satisfaction	-11.0	QoL	-60.0	Social Support	-80.0	Health Status	-50.0
Digit Symbol	15.0	Life Satisfaction	-12.0	QoL	-65.0	Social Support	-85.0	Health Status	-55.0
Trail Making Test B	20.0	Life Satisfaction	-13.0	QoL	-70.0	Social Support	-90.0	Health Status	-60.0
Block Design	17.0	Life Satisfaction	-14.0	QoL	-75.0	Social Support	-95.0	Health Status	-65.0
Verbal Fluency	22.0	Life Satisfaction	-15.0	QoL	-80.0	Social Support	-100.0	Health Status	-70.0
Stroop Test	19.0	Life Satisfaction	-16.0	QoL	-85.0	Social Support	-105.0	Health Status	-75.0
Digit Symbol	16.0	Life Satisfaction	-17.0	QoL	-90.0	Social Support	-110.0	Health Status	-80.0
Trail Making Test B	21.0	Life Satisfaction	-18.0	QoL	-95.0	Social Support	-115.0	Health Status	-85.0
Block Design	18.0	Life Satisfaction	-19.0	QoL	-100.0	Social Support	-120.0	Health Status	-90.0
Verbal Fluency	23.0	Life Satisfaction	-20.0	QoL	-105.0	Social Support	-125.0	Health Status	-95.0
Stroop Test	20.0	Life Satisfaction	-21.0	QoL	-110.0	Social Support	-130.0	Health Status	-100.0
Digit Symbol	17.0	Life Satisfaction	-22.0	QoL	-115.0	Social Support	-135.0	Health Status	-105.0
Trail Making Test B	22.0	Life Satisfaction	-23.0	QoL	-120.0	Social Support	-140.0	Health Status	-110.0
Block Design	19.0	Life Satisfaction	-24.0	QoL	-125.0	Social Support	-145.0	Health Status	

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:)
)
Kenneth WILLS)
)
Serial No.: Continuation of 09/226,196) Group Art Unit: 2771
(Filed January 7, 1999))
)
Filed: Herewith) Examiner: T. Haven
)
For: INFORMATION SEARCH AND)
RETRIEVAL WITH)
GEOGRAPHIC COORDINATES)

Assistant Commissioner for Patents
Washington, DC 20231

Sir:

PRELIMINARY AMENDMENT

Prior to the examination of the above application, please amend this application as follows:

IN THE TITLE:

Please change the title to:

- - METHODS AND SYSTEM FOR INFORMATION SEARCH AND RETRIEVAL - -.

IN THE CLAIMS:

Please cancel claims 1-16, and insert the following new claims:

- - 17. A method for retrieving information, comprising:

sending a request identifying a first site, and range data defining a distance from the first

site; and

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receiving trip planning information selected based on the identified site and the range data.

18. The method of claim 17, wherein the trip planning information includes information identifying a location of interest within a proximity of the first site derived from the range data.

19. The method of claim 17, wherein the trip planning information includes information identifying services available within a proximity of the first site derived from the range data.

20. The method of claim 17, wherein the request further includes a second site, and wherein the trip planning information includes information identifying a location of interest associated with the second site.

21. The method of claim 17, wherein the request further includes a second site and second range data defining a distance from the second site, and wherein the trip planning information includes information identifying selected locations of interest within a proximity of the first and second sites.

22. The method of claim 20, wherein the locations of interest each provide services similar to services provided by the second site.

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23. A method for searching and retrieving information, comprising:

receiving a request identifying a first site and range data defining a distance from the first site;

selecting trip planning information based on the identified first site and the range data;

and

outputting the selected trip planning information.

24. The method of claim 23, wherein the trip planning information includes

information identifying a location of interest within a proximity of the first site derived from the range data.

25. The method of claim 23, wherein the trip planning information includes

information identifying services available within a proximity of the first site derived from the range data.

26. The method of claim 23, wherein the request further includes a second site, and

wherein the trip planning information includes information identifying a location of interest associated with the second site.

27. The method of claim 23, wherein the request further includes a second site and

second range data defining a distance from the second site, and wherein the trip planning

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information includes information identifying selected locations of interest within a proximity of the first and second sites.

28. The method of claim 27, wherein the locations of interest each provide services similar to services provided by the second site.

29. A method for retrieving information, comprising:
sending a request identifying at least a first site, a second site and a type of location of interest; and
receiving information associated with the first and second sites and selected based on the type of location of interest and selected using a geometric shape generated based on the first and second sites.

30. The method of claim 29, wherein the information includes information related to locations of interest that are associated with the type of location of interest identified in the request, wherein the locations of interest are located within the geometric shape.

31. The method of claim 29, wherein the geometric shape is generated based on a first distance value representing the distance between the first and second sites, and a second distance value representing a function performed on the first distance value.

32. A method for searching and retrieving information, comprising:
receiving a request including a site and a type of location of interest;

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determining a range for the site based on stored information associated with the type of location of interest; and

providing trip planning information based on the range, the type of location of interest and the site.

33. The method of claim 32, wherein the trip planning information includes locations of interest located within the range of the site, and wherein the locations of interest are associated with the type of location included in the request.

34. The method of claim 33, wherein generating the range includes:
varying the range based on the number of locations of interest located within a predetermined distance of the site.

35. A method for retrieving information, comprising:
sending a first request including a site and a type of location of interest; and
receiving trip planning information selected based on a range, the site and the type of location of interest, wherein the range is based on stored information associated with the type of location of interest.

36. The method of claim 35, wherein the trip planning information includes locations of interest located within the range of the site, and wherein the locations of interest are associated with the type of location of interest included in the request.

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37. The method of claim 36, wherein the range is based on the number of locations of interest located within a predetermined distance of the site.

38. A method for searching and retrieving information, comprising:
receiving a request identifying at least a first site, a second site and a type of location of interest;
generating a geometric shape based on the first and second sites; and
sending information associated with the first and second sites and selected based on the type of location of interest.

39. The method of claim 38, wherein sending information includes:
collecting information related to locations of interest that are associated with the type of location of interest identified in the request, wherein the locations of interest are located within the geometric shape.

40. The method of claim 38, wherein generating the geometric shape includes:
determining a first distance value between the first and second sites;
performing a function on the first distance value to produce a second distance value; and
generating the geometric shape based on the first and second distance values. - -.

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Descriptive statistics	
Age (years)	34.5
Gender (male)	100
Height (cm)	175.5
Weight (kg)	75.5
Body mass index (kg/m ²)	24.5
Physical activity	
Time (h/week)	15.5
Intensity (MET)	1.5
Energy expenditure (kcal/week)	1500
Nutritional intake	
Energy (kcal/day)	2500
Protein (g/day)	100
Carbohydrate (g/day)	300
Fat (g/day)	100
Fiber (g/day)	30
Vitamin D (IU/day)	1000
Bone density	
Spine (T-scores)	-1.5
Hip (T-scores)	-1.5
Forearm (T-scores)	-1.5
Bone mineral content	
Spine (g)	1000
Hip (g)	1000
Forearm (g)	1000
Bone mineral density	
Spine (g/cm ³)	1.0
Hip (g/cm ³)	1.0
Forearm (g/cm ³)	1.0
Bone mineral density Z-scores	
Spine	-1.5
Hip	-1.5
Forearm	-1.5
Bone mineral density T-scores	
Spine	-1.5
Hip	-1.5
Forearm	-1.5
Bone mineral density Z-scores	
Spine	-1.5
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Forearm	-1.5
Bone mineral density T-scores	
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Hip	-1.5
Forearm	-1.5
Bone mineral density Z-scores	
Spine	-1.5
Hip	-1.5
Forearm	-1.5
Bone mineral density T-scores	
Spine	-1.5
Hip	-1.5

If there is any fee due in connection with the filing of this Preliminary Amendment,

Respectfully submitted,

Dated: October 30, 2000

By: _____

Joseph E. Palys
Reg. No. 46,508

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INFORMATION SEARCH AND RETRIEVAL
WITH GEOGRAPHICAL COORDINATES

BACKGROUND OF THE INVENTION

1. Field of the Invention.

The present invention is directed to an information search and retrieval system which will both search and provide return retrieval information in a text based format via the indexing of data through a geographical coordinate system.

2. Prior Art.

Computerized searching for relevant, specific information in a large body of unstructured text is necessarily a less efficient process than searching for such information in a structured file or database. One contributor to such search inefficiency is the fact that a word in the English language (or any other language) may carry several unrelated meanings. The context or expression within which any word occurs usually makes it clear to the average reader which meaning, among several alternatives, is appropriate. For example, it may not even occur to the reader of a paragraph dealing with wood shaping tools such as augers, chisels and planes, that the word *planes* could mean *aircraft*.

Another, perhaps greater difficulty for computerized text search and retrieval is that search arguments and responses often contain proper nouns. Whereas language dictionaries may help resolve ambiguities of common nouns, they typically provide little or no help in disambiguating proper nouns (names). Book publishers

typically employ editors and make them responsible for compiling indexes to scholarly publications. Out of necessity, these editors must be sufficiently educated in the subject of the publication in order to resolve ambiguous names included in the index. For example, a book on British history might contain several references to Churchill. The compiler of the index would then be obligated to create a separate entry for each "distinct" individual named Churchill, and further include reference pointers to all appropriate pages containing information relating to such individual entries.

An even more pronounced difficulty is realized in the instance of place names. A compiler of an index to a book might discriminate between multiple locations sharing the same name, by adding distinguishing attributes such as county, state or country. A reader of a book about the American Mid-West seeking information about "Springfield" would likely discover that there are cities of that name in Illinois, Missouri and Ohio, thanks to the efforts of the index compiler. However, a search for information about Springfield in a loosely defined body of text or a database such as the World Wide Web has no such support from an index. Using any one of the currently available Internet search tools, the user is faced with a serious deficiency, as a search for Springfield will retrieve all documents from the World Wide Web containing that proper noun, irrespective of the city to which the "searcher" meaningfully refers. The searcher or user might then constrain the search somewhat by using additional search arguments such as '

"Springfield MO" OR "Springfield Missouri" '. The retrieved, revised results would then relate to the intended Springfield. However, in this instance the search would have then ignored all other documents containing the simple unqualified name Springfield - even if such references were directed towards the intended Springfield. Typically, the scope of any document sets the context for the use of place names within it, and so a listing of, say, all the travel agents in Missouri would use their city names without any State qualification.

The problem becomes even more significant should the user wish to retrieve documents containing information about places within, and restricted to, a specific area. For example, if the user wants to learn about Bed & Breakfast establishments in California's Napa Valley, many highly relevant documents might not contain the phrase "Napa Valley". Instead, they might very well contain and refer to a city within California's Napa Valley. 'St. Helena,' serves as an example of such a city. In today's "unlimited access to unlimited information" environment, a competent search engine must be able to discriminate and comprehend the geographical limits of any given area, and retrieve all relevant documents satisfying search arguments within that area. In this example, a competent search engine would find and return all documents describing Bed and Breakfast establishments in Napa Valley's Saint Helena, but ignore any such documents relating to the island of St. Helena in the South Atlantic.

All of these problems are exacerbated by the growth of computer networks including the World Wide Web which is a large network of networks, all interconnected.

The present invention provides a means of resolving all existing search and retrieval deficiencies noted above by means of enhanced database index processing.

Though various navigation systems have been used in the past (for example, see Nimura Patent No. 5,231,584) they are not capable of indexing documents from a variety of sources in a coordinates system for later reference and retrieval.

Also in the past, various digital mapping systems have been provided, which may include a location index. Lamoure (U.S. Patent No. 5,329,108) shows one such example. Nevertheless, none of the prior art mapping systems provide an indexing system for searching and retrieval of multiple documents based on coordinates indexing.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a diagram illustrating the document indexing component of the information search and retrieval with geographical coordinates invention.

Figure 2 is a diagram illustrating the document retrieval component of the subject invention.

Figure 3 is a diagram illustrating the "proximity based" document retrieval component of the subject invention.

Figure 4 is a diagram illustrating search argument expansion components of the subject invention.

Figure 5 is a logic flow diagram of the invention's document indexing component.

Figure 6 is a logic flow diagram of the invention's document retrieval component.

Figure 7 is a logic flow diagram of the invention's "proximity based" document retrieval component.

Figure 8 is a logic flow diagram of the invention's search area expansion component.

Figure 9 is an illustration depicting the relationships between index structures of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The following definitions apply throughout the application.

Source Document 100 - a text based document which may be indexed for subsequent retrieval. Examples of documents would be a document located in a computer file or an Internet based document such as that found on the World Wide Web.

Geographical Index 200 - a computer file or database of place names with their geographical coordinates such as latitude and longitude and other identifying characteristics.

Document Index 300 - a computer file or database of terms found in Source Documents and the geographical coordinates of place names found in source documents with pointers to the Source Documents containing them.

Referring to the drawings in detail, Figures 1 through 4 are diagrams showing four process components of the invention while Figures 5 through 8 illustrate a step by step chart of the four process components.

Process Component 1 applies to boxes 1 - 11 of Figures 5A and 5B.

Process Component 2 applies to boxes 12 - 17 of Figure 6.

Process Component 3 applies to boxes 18 - 21 of Figure 7.

Process Component 4 applies to boxes 22 - 27 of Figure 8.

Process Component 1: Update indexes for documents to be accessed

As seen in Figure 1, the purpose of the initial process component is to scan Source Documents (see definitions) and create

index entries for all geographical terms found in them, so that subsequent searches for the same geographical area(s) will be able to find the relevant Source Documents. This process need be executed once only for each Source Document. The index entries are placed in a Document Index (see definitions), which may be a discrete index or physically form a subset of some other index. If a similar entry already exists in the Document Index, that entry is updated to point additionally to the new Source Document.

It is assumed that this process has access to the Geographical Index (see definitions), which has originally been constructed from an electronic gazetteer, that is to say, a file of place names with their distinguishing attributes and geographical coordinates such as latitude and longitude. The Geographical Index may also be a discrete index or form part of a larger file or database. Note that the Geographical Index is organized by place names, but the Document Index is organized by sets of geographical coordinates.

The geographical coordinates in the present embodiment are latitude and longitude although other coordinate systems are possible.

The user of the initial process may be a provider of a service to the users of the second process components to be described. Without the completion of this process component for each Source Document, the users of process component 2 will be unable to retrieve relevant Source Documents.

The process component as illustrated in Figure 1 and set forth in flow chart form in Figures 5A and 5B can be envisaged as

follows, although this is not the only way in which it might be embodied. The user executes this process component by running a specially written program or programs on a computer having a central processing unit that has access to (a) Source Documents 100
5 to be indexed, (b) the Geographical Index 200, and (c) the Document Index 300. By selecting a Source Document (for example, from a list or menu of non-indexed Source Documents), the user causes its contents to be displayed on the computer screen. The progress of the steps within this process component can be seen graphically in
10 the way the contents are represented. This is assumed in the paragraphs below. The process component description assumes that the program and the user will each pass several times through a given Source Document. In practice, some process steps could be combined to reduce the number of passes.

15 After the user has selected the Source Document to be indexed, the program checks to see whether each word or phrase within it already exists in the Geographical Index. If it does, the depiction of that word or phrase on the screen is highlighted with a yellow background to indicate a first category ('Mark A'). The
20 program also uses some logic to determine whether other nouns or noun phrases might be place names, even though they do not yet exist in the Geographical Index. It highlights these with a blue background to indicate a second category ('Mark B'). Mark B indicates that a new entry may have to be made in the Geographical
25 Index 200.

The user's intent is to confirm that all words or phrases highlighted have been correctly recognized by the program as place names. The program will assist by guiding the user from each highlight to the next. At each one, the user indicates by a mouse click or a keystroke whether the highlight is correct or not. For example, the program may have highlighted 'Bikini' and the user may determine that in its context this word refers to a garment. By indicating that the program is not correct, the user causes the highlighting to be turned off.

The user's intent is to find any place names in the Source Document that have been missed by the program. The user reads through the text, and selects any non-highlighted word or phrase that should be treated as a place name (for subsequent entry in the Geographical Index). The user causes the selected term to be highlighted with a blue background ('Mark B').

The program now examines each term in the Source Document highlighted with a yellow background ('Mark A'), one at a time. In a separate window or box on the screen, it displays the corresponding term and the associated distinguishing attributes and geographical coordinates retrieved from the Geographical Index. There may be more than one entry in the Geographical Index corresponding to the same term, in which case they are all displayed in the same separate window or box.

If only one entry exists in the Geographical Index for the term highlighted in the Source Document 100, the user compares it with the term retrieved from the Geographical Index 200. If they

correspond correctly, the user indicates that the reference is good. Although it now removes the highlight, the program remembers for step 11 that this entry will be updated in the Document Index to point to this Source Document 100. The user passes on to the next Mark A in the Source Document.

In the event that multiple entries for the same term have been retrieved from the Geographical Index, the user has more work to do (see steps 7 - 9 in Figure 5B).

In this event, the first decision the user has to make is whether any one of the multiple entries displayed in the separate window or box is the one that corresponds to the highlighted term in the Source Document. If it is, the user may make a mouse click on the correct entry, or else, if the multiple entries are numbered, enter that number on the keyboard. As in step 5, the highlight disappears, but the program still has to remember the user's action so that it can execute step 11.

If all of the multiple entries displayed in the separate window or box are incorrect, this means that the Geographical Index does not yet contain an entry for the place whose name has been highlighted in the Source Document. At this stage, the highlight is yellow (Mark A), because the program found at least one entry of the same term in the Geographical Index, but the user will need to create a new entry in step 10. The action to be taken in this step is to change the highlight from yellow to blue (Mark B).

[Note: this is also the action to be taken in step 5 if the single entry displayed from the Geographical Index was incorrect].

At this stage, all yellow highlights (Mark A) have been cleared from the displayed Source Document, either in step 5 or 8, or by changing to blue (Mark B). Each instance of a blue highlight (Mark B) now indicates that an entry needs to be added to the Geographical Index. The user obtains the distinguishing attributes and geographical coordinates such as latitude and longitude that need to be included in the entry, and enters these via the keyboard.

If the same term highlighted with Mark B occurs multiple times in the Source Document, the user will still need to confirm that the same place is referred to each time. Accordingly, once the entry has been added to the Geographical Index, the remaining instances of the same term in the Source Document will be converted back to Mark A, and step 5 etc. will be repeated for each such instance.

Finally, the program updates all the correct corresponding entries in the Document Index with pointers to the current Source Document, so that subsequent searches for the place names it contains will be able to retrieve this document. The organization of the entries in the Document Index is by the geographical coordinates found in the Geographical Index.

Process Component 2: Identification of documents containing desired place name.

The second process component of the invention is illustrated in the diagram of Figure 2 and is set forth in flow chart form in

Figure 6. The user of this process may be different from the user of the first process component, but depends on the completion of process component 1 for all Source Documents that are to be retrievable. The program or programs used in this process component may be purpose designed, or may take the form of modifications to other search program(s). The program may give the user the capability of specifying a complex search argument such as 'I want information about all Chinese restaurants in San Francisco.' It is assumed that the some of the Source Documents indexed in the first process are likely to contain the desired information.

Figure 6 illustrates a flow chart of the second process component. The user 400 is interested in a specific geographical place or area, and wishes to retrieve documents that relate to it in some way. The user 400 keys or selects a place name as part of the search argument as input to the search program, and submits an inquiry. The search program does not look for the existence of the specified place names in the Source Documents. Instead, it obtains the geographical coordinates of those place names from the Geographical Index.

If the desired place name refers to more than one place, as 'Paris' could be in France or in Texas, the Geographical Index will have multiple entries for that place name. In that case, before the search for relevant Source Documents can be made, the user is presented with a selection list from which to pick the desired place. The distinguishing attributes, such as State and Country

The third process component may be initiated by the user. Alternatively, the program may be initiated as a default if no responses are found in the second process.

5 It is assumed that this process component will work in conjunction with a natural language search engine such as Verity Search'97™, or a similar tool that can interpret the phrases entered by the user to specify proximity. A typical query might be: 'I want to know about Italian restaurants within 5 miles of Niagara Falls.' A more straightforward alternative would be to
10 provide a list of canned phrases and distances in the user interface computer screen, from which the user would simply select the appropriate ones for the search.

The query is similar to the one submitted in step 12, except for the inclusion of a proximity specification. A number of expressions can be used to specify various kinds of proximity. Similarly, a number of options are available for qualifying the acceptable distance parameter to be used in the search. For example, the program may ask the user to enter a radius in miles or kilometers, or to pick from a preset selection of suitable radii.
20 If the user does not qualify the distance, the program may default to a standard distance such as 10 kilometers, but a more sophisticated version would vary the standard according to the type of location specified. For example, 'hotels near the Empire State Building' should default to a lesser radius than 'hotels near
25 Yellowstone National Park.'

The program will obtain the geographical coordinates as in step 16, and will modify them according to the specified/qualified proximity into a form such as a mathematical shape or formula which it can use to determine a match with the coordinates stored in the Document Index.

One type of proximity specification which requires special treatment takes the form of 'between x and y,' as for example 'motels between Flagstaff and Phoenix.' The program will construct a shape such as a rhombus. Two opposite points of the rhombus correspond to the coordinates of Flagstaff and Phoenix, and the other two opposite points of the rhombus are set apart from each other by a calculated distance such as the square root of the distance between Flagstaff and Phoenix.

Finding a match in the Document Index 300 includes determining those points of interest which lie within whatever shape may be defined in steps 19 and 20. The resulting matches are used to identify the location of the Source Documents 100 to which they point.

Process Component 4: Expand search area for poorly satisfied queries.

A fourth additional option process component is shown in Figures 4A and 4B and is set forth in flow chart form in Figure 8. The fourth process component deals with steps to be taken at the end of process components 2 and 3 in the event that the search is unable to retrieve sufficient Source Documents 100 to satisfy the

user. This problem may arise from too narrow geographical criteria. However, if the user had asked the program to find information about volcanoes in New York, the appropriate action is not simply to expand the search area.

5 The assumption behind step 22 is that the program, with help from the user, can determine that there is a place name in the user's query that has not been included in the Geographical Index. This would be the case, for example, if the user had misspelled the place name. Various approaches to this function are possible, and
10 lie outside the scope of the current patent.

Various types of prompting are possible: Suppose that the user had tried without success to search for documents relating to 'San Matteo.' The program would indicate that no such place existed in its index. The user might then recognize the misspelling of the name and enter 'San Mateo.' If not, the user might change the request to 'San Francisco Bay Area.'

In another case, indicated in step 25 of Figure 8, the place name specified was valid, but there were not enough Source Documents relating to it. Again, various types of prompting are
20 possible. Suppose that the user had tried without success to search for documents relating to Boca Chica. At the prompting of the program, the user could modify the search to 'within 50 miles of Key West,' 'in the Florida Keys' or 'between Key West and Key Largo.'

25 Figure 9 illustrates the relationship among the indexes and documents. The Geographical Index 200 is a database containing a

plurality of place name references, each reference having a corresponding set of geographical coordinates. The Document Index 300 is organized by sets of coordinates with a cross reference to a document, record or database. The Document Index 300 has the
5 addresses of the source documents referred to so that they can be accessed and the locations of the source documents retrieved.

The present invention may be used in a wide variety of applications. In travel services, a user may want to access a hotel in a given locale, a restaurant within a specified distance
10 from the hotel and other locations or services. Information on all of these references may be gathered and returned to the user.

Although the foregoing describes the present invention in detail, it is to be clearly understood that the same is to serve for purposes of illustration and example only and is not to be
15 regarded in any manner as an expression of invention limitation, the spirit and scope of the present invention being limited exclusively by the claims appended hereto.

What Is Claimed Is:

1 1. An information search and retrieval process using
2 geographical coordinates, which process comprises:

3 building an index of coordinates for a plurality of text
4 based references, resources or sites, each having a set of said
5 coordinates;

6 accepting a user inquiry containing a text reference;

7 converting said text reference specified in said user
8 inquiry to a set of coordinates;

9 searching against said index of coordinates based on the
10 converted coordinates of said user inquiry reference; and

11 returning all information retrieved from said searching
12 in a text based format.

1 2. An information search and retrieval process as set forth
2 in Claim 1 wherein said references, resources or sites each refers
3 to travel references, such as hotels.

1 3. An information search and retrieval process as set forth
2 in Claim 1 wherein said text based references, resources and sites
3 are obtained from documents in a file.

1 4. An information search and retrieval process as set forth
2 in Claim 3 including a plurality of said files such as the World
3 Wide Web.

1 5. An information search and retrieval process as set forth
2 in Claim 4 including the additional step of retrieving the location
3 of said documents from those identified in said searching.

1 6. An information search and retrieval process as set forth
2 in Claim 1 wherein said index of coordinates comprise latitude and
3 longitude coordinates.

1 7. An information search and retrieval process as set forth
2 in Claim 1 including the additional step of searching against the
3 coordinates index based on proximity to said user inquiry set of
4 coordinates.

1 8. An information search and retrieval process as set forth
2 in Claim 1 including the additional step of expanding the
3 coordinates in the event that references are not returned from the
4 initial searching.

1 9. An information search and retrieval process as set forth
2 in Claim 1 including the additional step of updating the coordinate
3 index with additional documents.

1 10. An information search and retrieval process as set forth
2 in Claim 3 including the additional step of updating said index of
3 coordinates with additional references, resources or sites.

1 11. An information search and retrieval process as set forth
2 in Claim 1 wherein said step of accepting a user inquiry and
3 converting said text reference includes checking multiple entries
4 for place names.

1 12. A geographical coordinates information search and
2 retrieval system which comprises:

3 an index of coordinates for a plurality of text based
4 references, resources or sites, each having a set of said
5 coordinates;

6 means to accept a user inquiry containing a text
7 reference;

8 a set of coordinates for said user inquiry text reference
9 converted from said text reference; and

10 means to search against said coordinates index for said
11 inquiry set of coordinates and to return information retrieved from
12 said search.

1 13. A geographical coordinates information search and
2 retrieval system as set forth in Claim 12 wherein said text based
3 references, resources or sites are obtained from documents in a
4 file.

1 14. A geographical coordinates information search and
2 retrieval system as set forth in Claim 13 wherein said means to
3 return information retrieved includes return of the location of
4 said documents to said user.

1 15. A geographical coordinates information search and
2 retrieval system which comprises:

3 a plurality of documents from a source file or source files
4 such as the world wide web;

5 a geographical index containing text based references,
6 resources or sites, each cross-referenced to a set of coordinates;
7 and

8 a document index categorized by said coordinates with cross
9 references to said text based references, resources, or sites.

1 16. A geographical coordinates information search and
2 retrieval system as set forth in claim 15 wherein said geographical
3 index is stored on a database connected to a central processing
4 unit.

INFORMATION SEARCH AND RETRIEVAL
WITH GEOGRAPHICAL COORDINATES

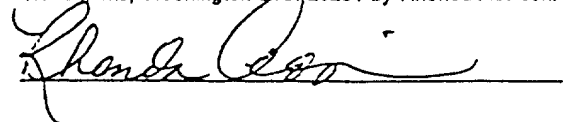
ABSTRACT OF THE DISCLOSURE

5 An information search and retrieval process using geographical coordinates. An index of coordinates is built for a plurality of text based references, resources or sites, each having a set of said coordinates. A user inquiry is accepted containing a text reference. The text reference specified in the user inquiry is converted to a set of coordinates. A search is thereafter conducted against the index of coordinates based on the converted coordinates of the user inquiry reference. All information retrieved from the search is returned in a text based format.

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Date of Deposit: July 2, 199

I hereby certify that this paper or fee is being deposited with the United States Postal Service "Express Mail Post Office Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to the Commissioner of Patents and Trademarks, Washington D.C. 20231 by Rhonda Addison.



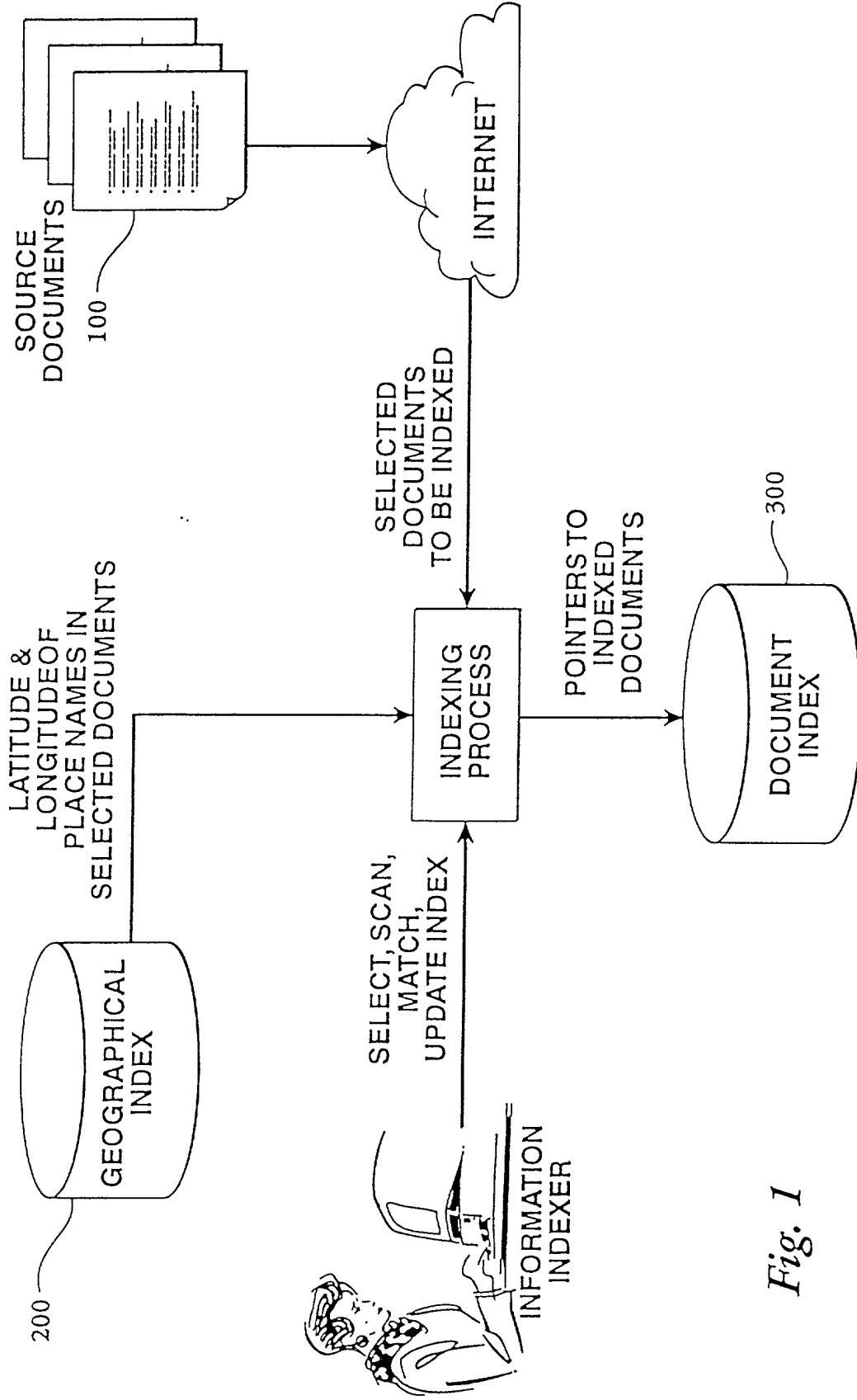


Fig. 1

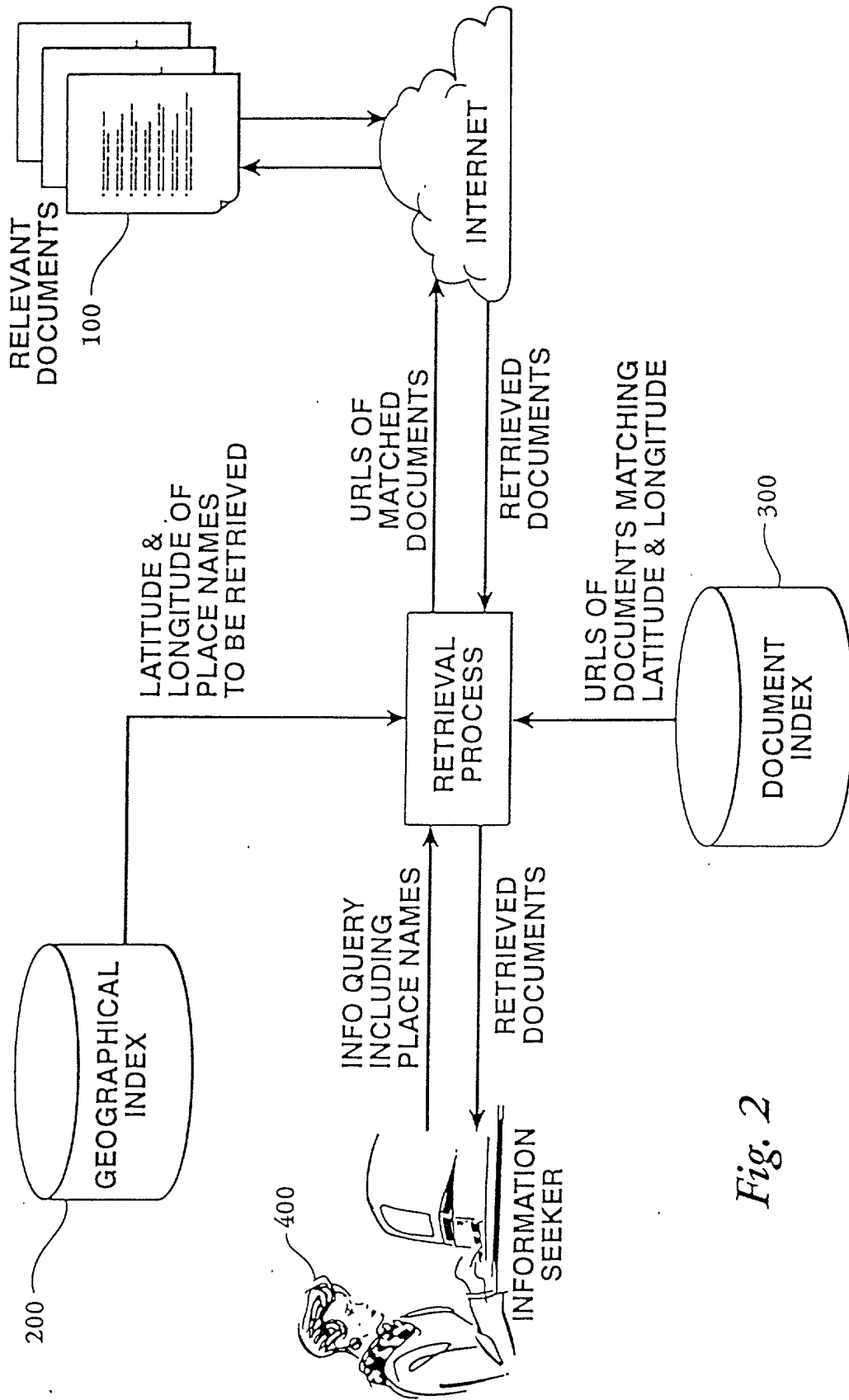


Fig. 2

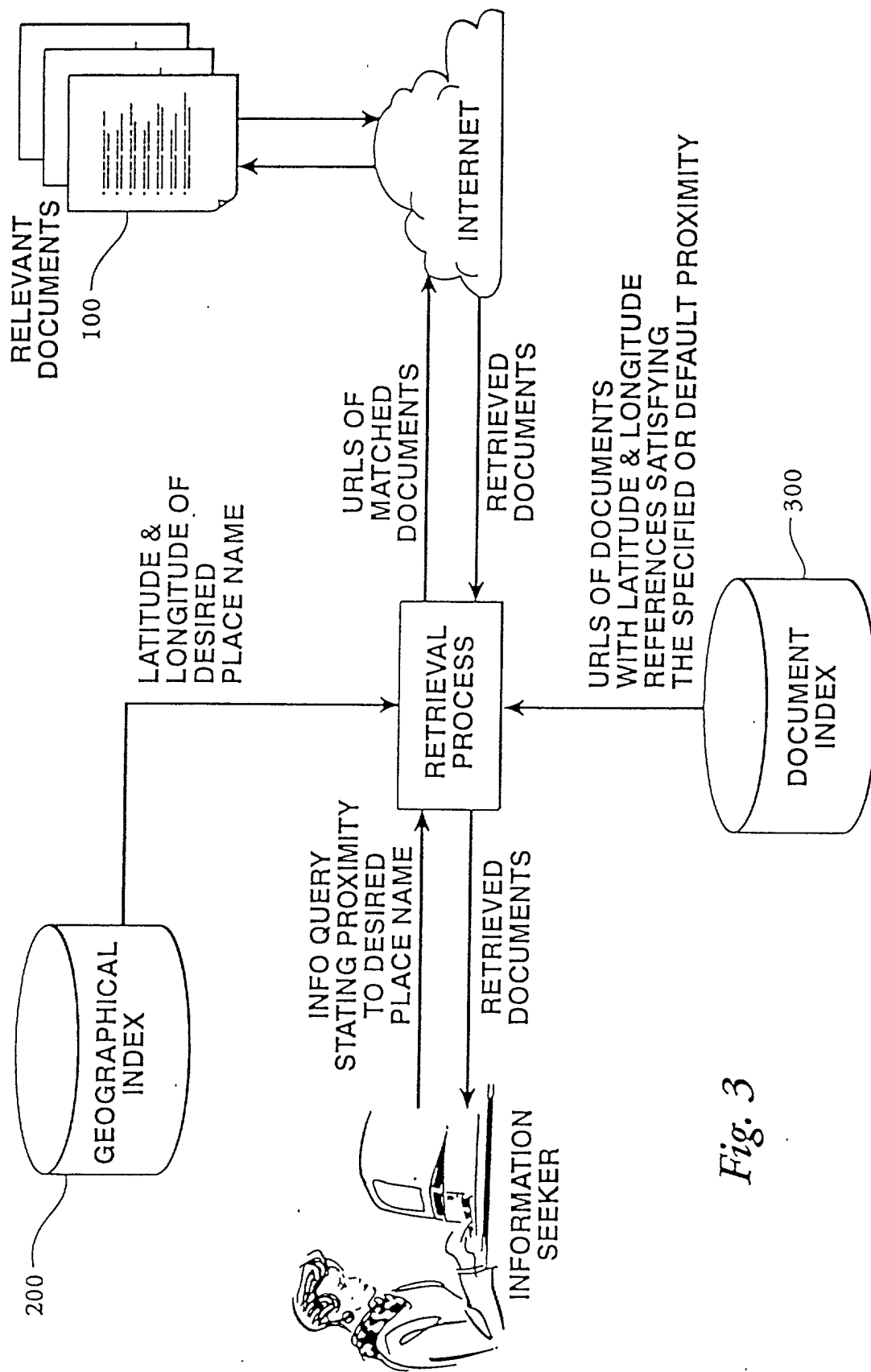
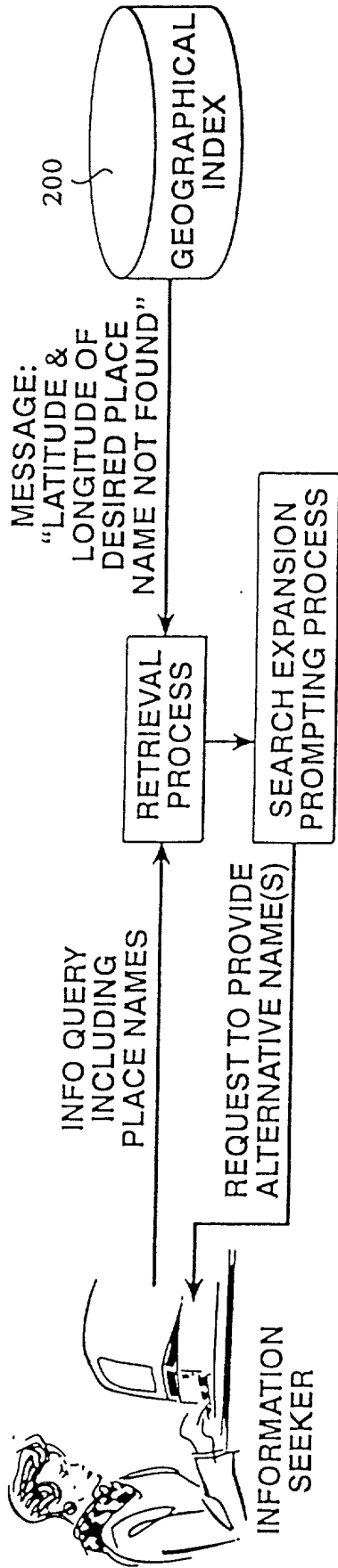
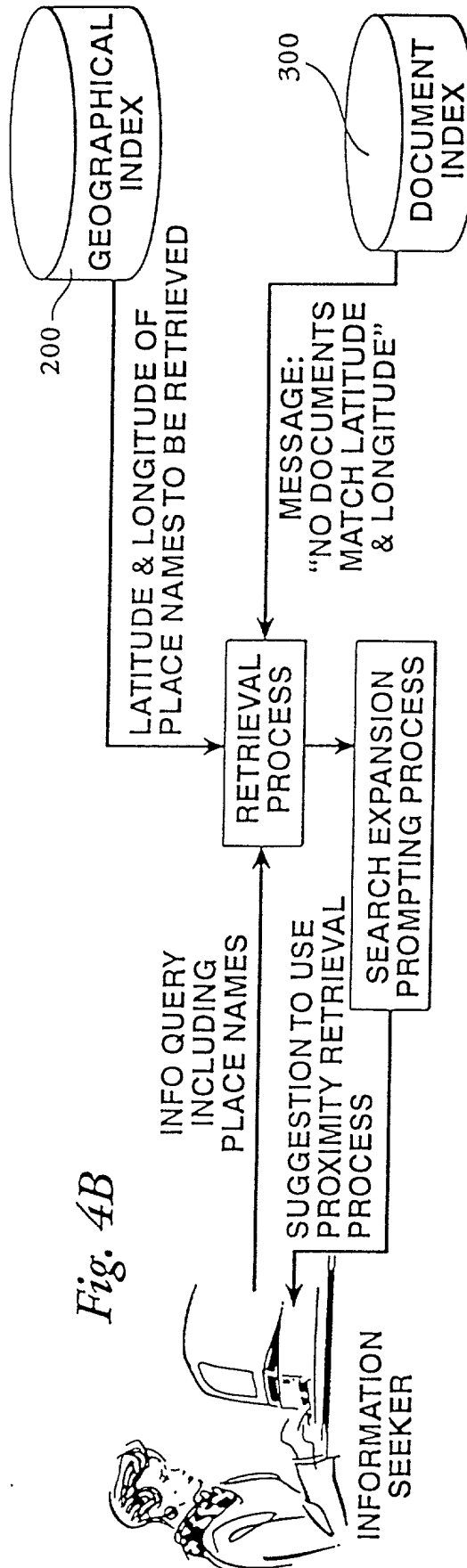


Fig. 3



* NAME NOT FOUND IN GEOGRAPHICAL (LONGITUDE/LATITUDE) INDEX. RETURN TO USER AND REQUEST EXPANSION OF SEARCH PARAMETERS.

Fig. 4A



* 'NAME' EXISTS IN GEOGRAPHICAL (LONGITUDE/LATITUDE) INDEX. HOWEVER DOCUMENTS FOR THIS NAME (LOCATION) DO NOT EXIST. RETURN TO USER PARTY (USER) AND REQUEST EXPANSION OF SEARCH PARAMETERS.

COMPONENT 1: UPDATE INDEXES FOR
DOCUMENTS TO BE ACCESSED.

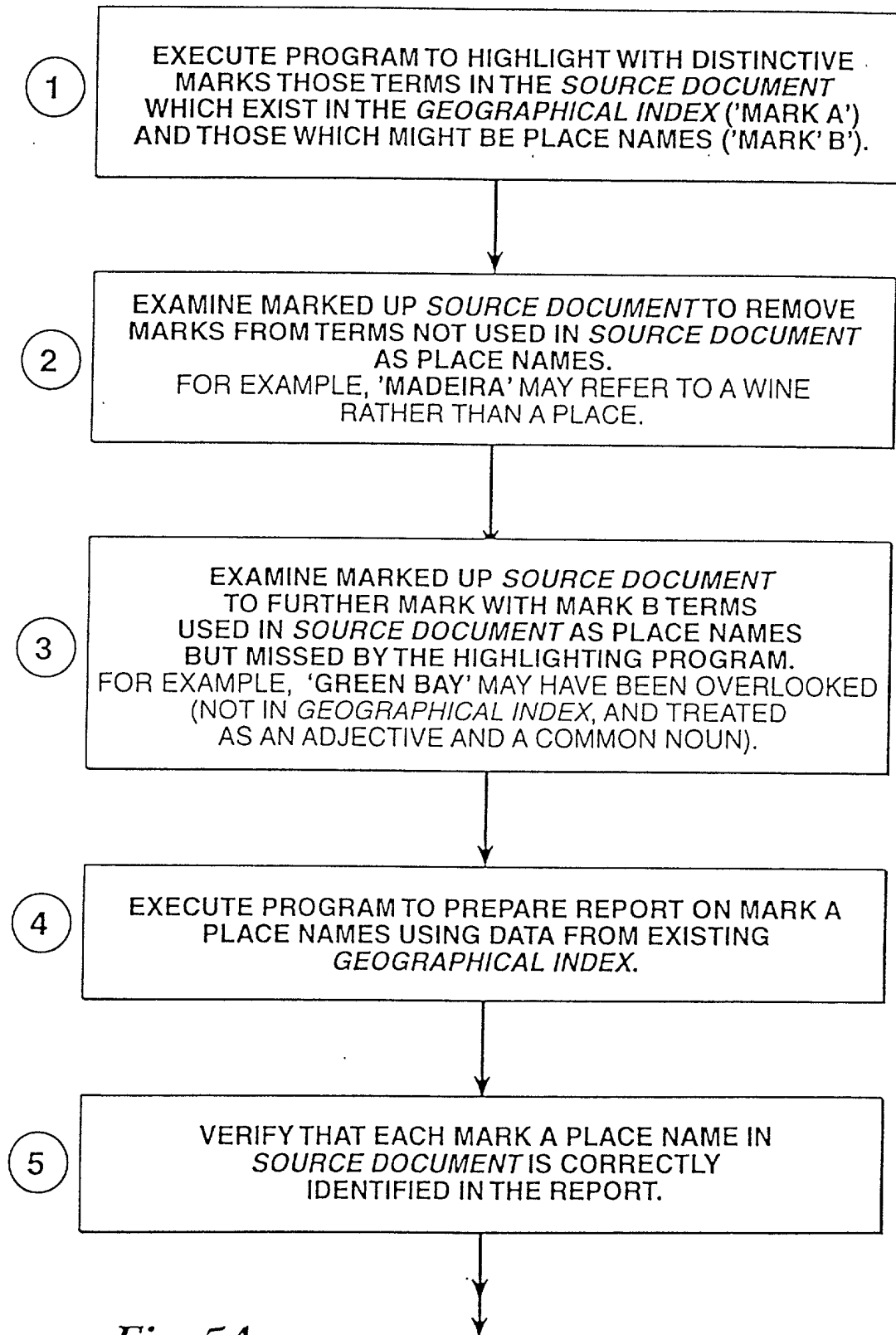


Fig. 5A

COMPONENT 1 (CONTINUED)

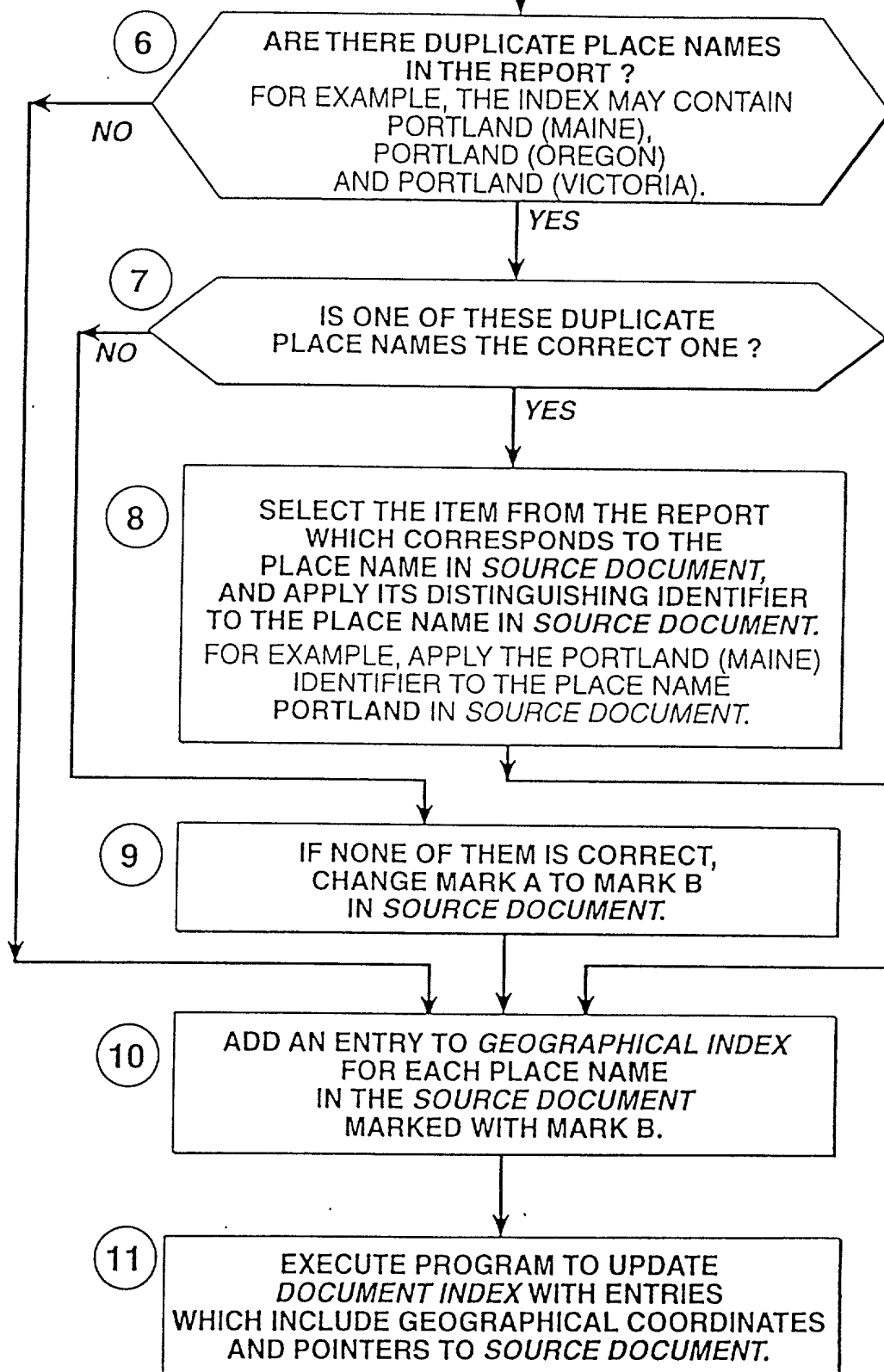


Fig. 5B

COMPONENT 2: RETRIEVE DOCUMENTS
CONTAINING DESIRED PLACE NAME.

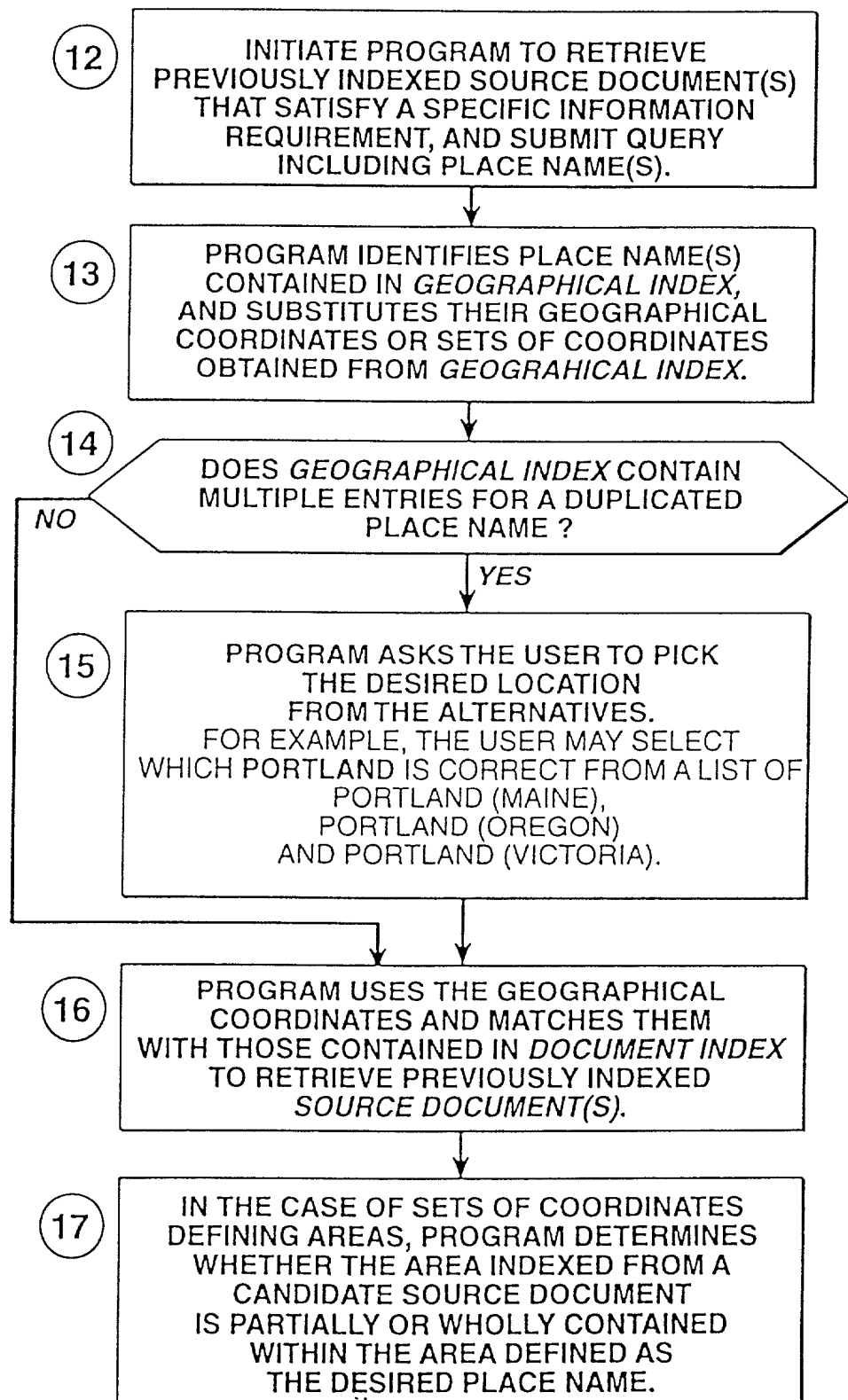


Fig. 6

COMPONENT 3: RETRIEVE DOCUMENTS BASED ON
PROXIMITY TO DESIRED PLACE NAME.

THIS IS A SPECIAL CASE OF COMPONENT 2.
ADDITIONAL STEPS ARE:

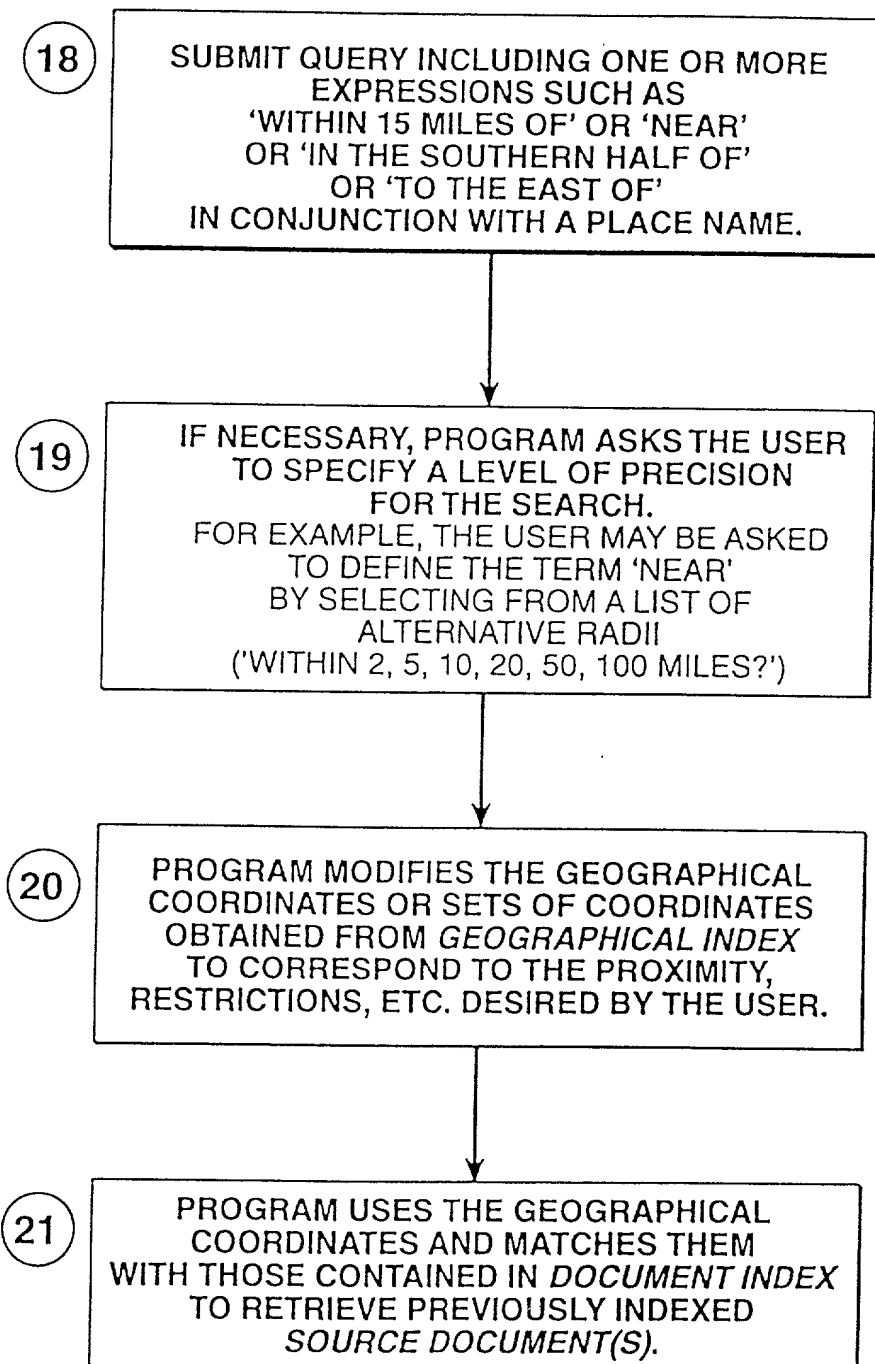


Fig. 7

COMPONENT 4: EXPAND SEARCH AREA FOR
POORLY SATISFIED QUERIES.

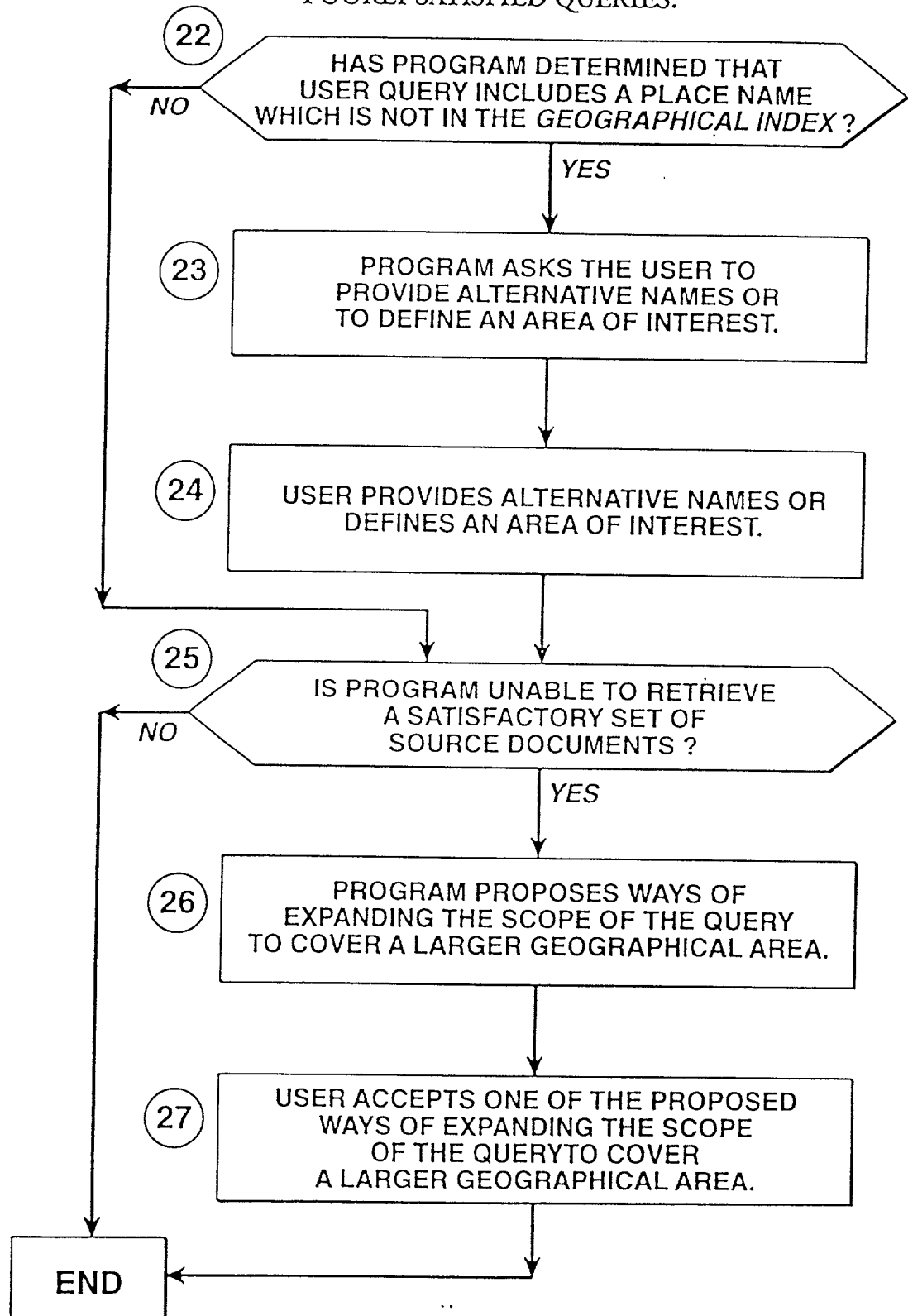


Fig. 8

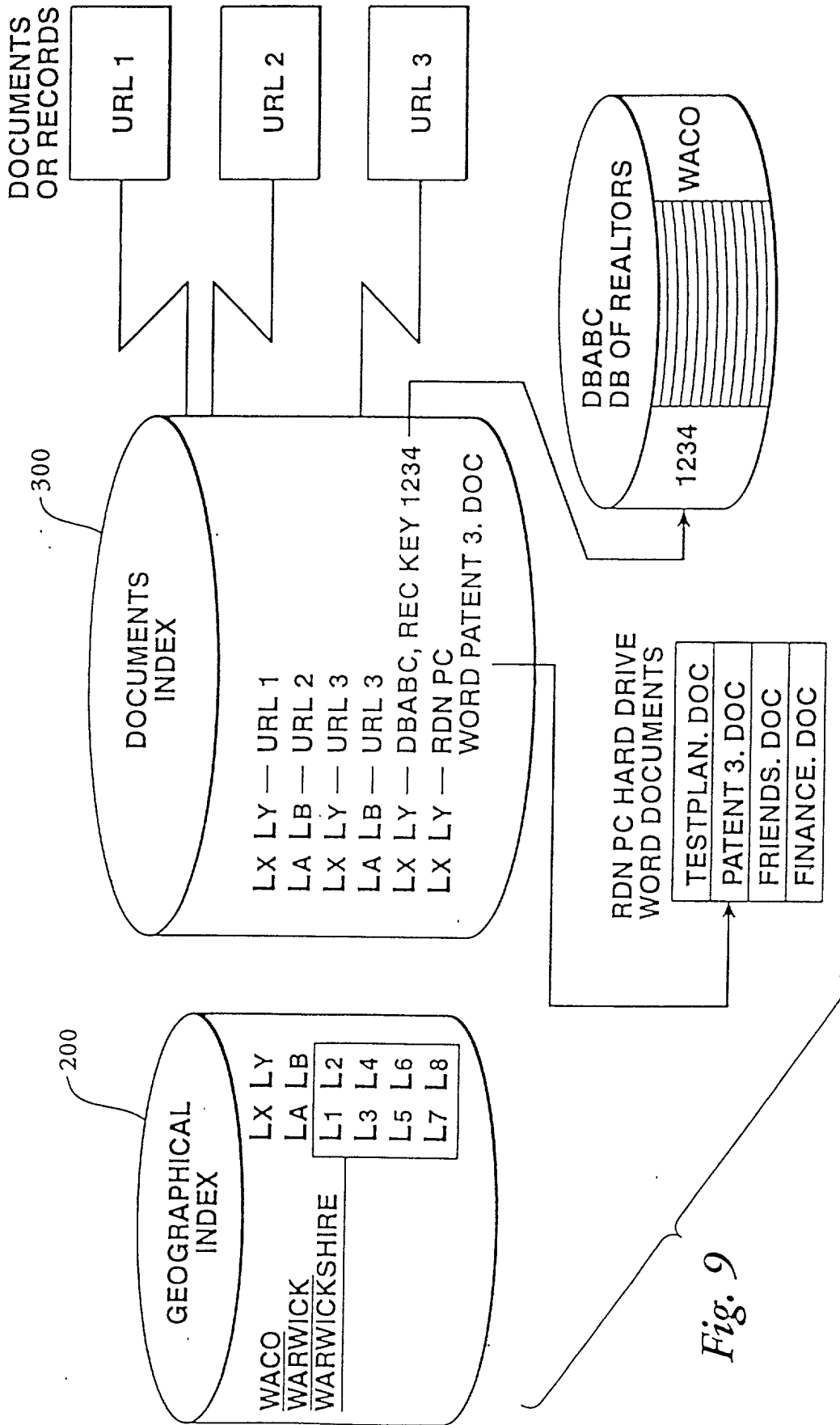


Fig. 9

DECLARATION AND POWER OF ATTORNEY

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

INFORMATION SEARCH AND RETRIEVAL WITH GEOGRAPHICAL COORDINATES

the specification of which (check one)

☒ [X] is attached hereto.

☐ [] was filed on _____ as Application Serial No. _____.

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, Section 1.56 (a).

I hereby claim foreign priority benefits under Title 35, United States Code, Section 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application to which priority is claimed:

PRIOR FOREIGN APPLICATION(S)

			Priority Claimed	
			<input type="checkbox"/>	<input type="checkbox"/>
(Number)	(Country)	(Day/month/year filed)	Yes	No
_____	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>
(Number)	(Country)	(Day/month/year filed)	Yes	No
_____	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>
(Number)	(Country)	(Day/month/year filed)	Yes	No

I hereby claim the benefit under Title 35, United States Code, Section 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, Section 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, Section 1.56 (a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

(Appl. Serial No.) (Filing date) (Status) (patented, pending, abandoned)

(Appl. Serial No.) (Filing date) (Status) (patented, pending, abandoned)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

POWER OF ATTORNEY: As named inventor, or named inventors, I (We) hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith.

James R. Head, Registration No. 18,683
Paul H. Johnson, Registration No. 19,224
Mark G. Kachigian, Registration No. 32,840
R. Alan Weeks, Registration No. 36,050
Serge Novovich, Registration No. 26,780

of Head, Johnson & Kachigian, 228 West 17th Place, Tulsa, Oklahoma 74119, Telephone Number (918) 587-2000, members of the Bar of the State of Oklahoma, and

Robert R. Keegan, Registration No. 18,614
Daniel R. Alexander, Registration No. 32,604

of Head, Johnson & Kachigian, E.J. Ball Building, Suite 230, 112 West Center Street, Fayetteville, Arkansas, 72701, Telephone Number (501) 521-9111, members of the Bar of Arkansas, to prosecute this application to register, to transact all business in the Patent and Trademark Office in connection therewith, and to receive the Letters Patent Document, if issued.

DIRECT TELEPHONE CALLS TO:

Mark G. Kachigian
(918) 587-2000

Full name of first or sole inventor: **KENNETH WILLS**

Agnes

June 27 1997

DATE _____

Grapevine, Texas

Subject of the United Kingdom of Great Britain and Northern Ireland

5308 Shadow Glen Drive
Grapevine, Texas 76051

Table 1. Demographic and clinical characteristics of the study population	
Demographics	
Age (mean \pm SD)	65.2 \pm 12.5
Gender (Male/Female)	112/88
Ethnicity (White/Black/Hispanic/Asian)	150/45/30/15
Education (High School/Graduate)	180/60
Clinical Characteristics	
Duration of Diabetes (mean \pm SD)	15.3 \pm 8.7
HbA1c (mean \pm SD)	8.2 \pm 1.5
Insulin Use (Yes/No)	140/60
Comorbidities (Hypertension/Cholesterol/Heart Disease)	120/90/70
Medication (Insulin/Oral Hypoglycemics)	140/60
Smoking Status (Smoker/Non-smoker)	40/160
Alcohol Consumption (Regular/Occasional/None)	30/80/150
Family History (Diabetes/Heart Disease/Hypertension)	100/110/120
Previous Complications (Retinopathy/Nephropathy/Neuropathy)	80/90/100
Current Complications (Retinopathy/Nephropathy/Neuropathy)	70/80/90
Quality of Life (SF-36 Score)	45.2 \pm 10.5
Healthcare Utilization (Hospitalizations/Visits)	12/150
Health Insurance (Medicaid/Medicare/Private)	100/140
Health Literacy (High/Low)	110/80
Health Beliefs (Positive/Negative)	120/70
Health Behaviors (Exercise/Diet)	130/60
Health Status (Stable/Unstable)	110/80
Health Outcomes (Mortality/Morbidity)	10/120
Healthcare Costs (Outpatient/Inpatient)	150/60
Healthcare Access (Barriers/Facilitators)	140/60
Healthcare Satisfaction (Satisfied/Dissatisfied)	130/70
Healthcare Engagement (Engaged/Disengaged)	120/80
Healthcare Compliance (Compliant/Non-compliant)	110/90
Healthcare Adherence (Adherent/Non-adherent)	100/100
Healthcare Utilization (Hospitalizations/Visits)	12/150
Health Insurance (Medicaid/Medicare/Private)	100/140
Health Literacy (High/Low)	110/80
Health Beliefs (Positive/Negative)	120/70
Health Behaviors (Exercise/Diet)	130/60
Health Status (Stable/Unstable)	110/80
Health Outcomes (Mortality/Morbidity)	10/120
Healthcare Costs (Outpatient/Inpatient)	150/60
Healthcare Access (Barriers/Facilitators)	140/60
Healthcare Satisfaction (Satisfied/Dissatisfied)	130/70
Healthcare Engagement (Engaged/Disengaged)	120/80
Healthcare Compliance (Compliant/Non-compliant)	110/90
Healthcare Adherence (Adherent/Non-adherent)	100/100

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:) ATTN: APPLICATION
BRANCH)
Kenneth Wills)
Serial No.: 08/887,471) Group Art Unit: Unassigned
Filed: July 2, 1997) Examiner: Unassigned
For: INFORMATION SEARCH AND)
RETRIEVAL WITH GEOGRAPHICAL)
COORDINATES)

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

REVOCATION OF ORIGINAL POWER OF ATTORNEY
AND GRANT OF NEW POWER OF ATTORNEY BY ASSIGNEE

The assignee of record in the present application, Serial No. 08/887,471, is The SABRE Group, Inc. As an officer of The SABRE Group, Inc., I hereby revoke the previous Power of Attorney in the above application to Sanford E. Warren, Jr. and the firm of Warren & Perez, and hereby grant a new power of attorney to **FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER, L.L.P., Reg. No. 22,540**, Douglas B. Henderson, Reg. No. 20,291; Ford F. Farabow, Jr., Reg. No. 20,630; Arthur S. Garrett, Reg. No. 20,338; Donald R. Dunner, Reg. No. 19,073; Brian G. Brunsvold, Reg. No. 22,593; Tipton D. Jennings, IV, Reg. No. 20,645; Jerry D. Voight, Reg. No. 23,020; Laurence R. Hefter, Reg. No. 20,827; Kenneth E. Payne, Reg. No. 23,098; Herbert H. Mintz, Reg. No. 26,691; C. Larry O'Rourke, Reg. No. 26,014; Albert J. Santorelli, Reg. No. 22,610; Michael C. Elmer, Reg. No. 25,857; Richard H. Smith, Reg.

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of)
Kenneth WILLS)
Serial No. 09/226,196) Group Art Unit: 2771
Filed: January 7, 1999) Examiner: T. Havan
For: INFORMATION SEARCH AND)
RETRIEVAL WITH GEOGRAPHICAL)
COORDINATES)

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

**REVOCATION OF POWER OF ATTORNEY
AND GRANT OF NEW POWER OF ATTORNEY**

The undersigned, a representative authorized to sign on behalf of the assignee owning all of the interest in this patent, hereby revokes all previous powers of attorney or authorization of agent granted in this application before the date of execution hereof.

The undersigned verifies that Travelocity.com LP is the assignee of the entire right, title, and interest in the patent application identified above by virtue of an assignment filed concurrently herewith. The undersigned certifies that the evidentiary documents have been reviewed and to the best of the undersigned's knowledge and belief, title is in the assignee Travelocity.com LP. Attached hereto is the Certificate Under 37 C.F.R. §3.73(b).

The undersigned hereby grants its power of attorney to **FINNEGAN,**
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